Introduction

One-seventh of the world’s population—more than 1.14 billion people—has an Aadhaar number, a biometrically enabled unique digital identity. This makes Aadhaar the world’s largest digital identity programme implemented by a national government. With a handful of exceptions, most Indian states have enrolled more than 80 percent of their residents. Aadhaar’s scale has caught the attention of policy-makers globally.

According to the Unique Identification Authority of India (UIDAI), which issues Aadhaar numbers, Aadhaar represents a potentially transformative way for citizens, governments, and businesses to interact with each other. Aadhaar’s uses have already achieved significant reach in some areas, as shown in Figure ES.1 below.

Yet, for an identity programme that is increasingly central to India’s economy and development efforts, there are gaps in our understanding of Aadhaar’s coverage and performance in key areas. There is little publicly available data on Aadhaar’s use-cases. As a starting point, a comprehensive catalogue of Aadhaar’s public and private sector use-cases did not previously exist. To try and address this data gap, we have compiled an initial list of nearly 600 use-cases available on our website, StateofAadhaar.in. Furthermore, there are important open questions on the reach of these use-cases and their performance in improving public service delivery and socioeconomic outcomes. A systematic, multi-disciplinary, and large-scale research effort is critical to build a meaningful understanding of whether, where, and how Aadhaar might advance the public good.

The lack of coherent and comprehensive evidence on the Aadhaar experience provides the motivation for the State of Aadhaar Report 2016-17.

The full report is available for download on StateofAadhaar.in. With this executive summary, we hope to provide a brief synthesis of the report.

Figure ES.1: Reach of Aadhaar’s enrolment and uses

<table>
<thead>
<tr>
<th>Aadhaar Enrolment</th>
<th>Authentication</th>
<th>e-KYC</th>
<th>Direct Benefit Transfer</th>
<th>Seeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.14 billion</td>
<td>139 million</td>
<td>44.7 million</td>
<td>₹22,006 crore ($3.3 billion)</td>
<td>167 million</td>
</tr>
<tr>
<td>People enrolled in Aadhaar as of Mar ’17</td>
<td>Monthly average of people authenticating themselves using Aadhaar in the latter half of FY 2016-17</td>
<td>Number of bank accounts opened using Aadhaar e-KYC as of Mar ’17</td>
<td>Total DBT payments sent using the Aadhaar Payment Bridge System in FY 2016-17</td>
<td>Number of POS (food subsidy) beneficiary households with at least one member seeded to Aadhaar</td>
</tr>
<tr>
<td>85% of India’s population in 2017</td>
<td>12% of Aadhaar enrollees</td>
<td>&lt;16% of Jan Dhan accounts opened as of Mar ’17</td>
<td>33% of the total DBT expenditure in FY 2016-17</td>
<td>72% of total beneficiary households</td>
</tr>
</tbody>
</table>

Sources used in this summary include (but are not limited to): UIDAI, DBT portal, DigiLocker dashboard, Gazette of India, NPCI, NSAP, Parliament questions, PDS portals (central and state governments), PMJDY, RBI, Supreme Court archives, TSOnline, and APOOnline. Refer to the full report on StateofAadhaar.in for detailed references.
Aadhaar architecture

Aadhaar is a unique biometric form of identification, which consists of a 12-digit random number that is tied to an individual’s biometric (finger print, iris scan and photograph) and demographic information. Since its inception in 2009, the UIDAI has created the technological and operational architecture to enrol Indian residents. This architecture enables digital authentication of individuals using their biometrics and Aadhaar number.

In Chapter 2 of the main report, we provide a detailed description of Aadhaar’s enrolment and authentication processes, and an overview of Aadhaar-enabled payment systems. We discuss data quality and security features of Aadhaar’s technical processes, and how independent research can strengthen their design and implementation.

Legal and governance framework

The legal framework of Aadhaar has evolved significantly since its inception. In 2009, the UIDAI was created using an executive order. Today, the Aadhaar Act 2016 constitutes the legislative framework governing Aadhaar. Aspects of this Act were actively deliberated when the bill was debated in the Rajya Sabha of Parliament. The legal standing of the Act and important aspects of the Aadhaar project—especially its implications for individuals’ privacy—are currently under challenge in the Supreme Court of India and await resolution. Research to inform important aspects of legislation—such as on questions of privacy and data security—will be valuable additions to policy, legislative, and judicial dialogue, benefitting Aadhaar and other digital services in India.

Financial inclusion

A growing body of evidence demonstrates the strong positive relationship between access to formal financial services and economic prospects for poor individuals and communities.

As part of the “JAM trinity” of Jan Dhan, Aadhaar, and Mobile, Aadhaar is increasingly integral to the Government of India’s efforts to aggressively increase financial inclusion in the country. In the last two and a half years, more than 282 million bank accounts have been created under the Jan Dhan scheme. In roughly the same time period, Aadhaar e-KYC was used to open 44.7 million bank accounts, eliminating the need for other identity documents. In Figure ES.2, we show the growth in e-KYC verifications (to open bank accounts and for other uses).

Figure ES.2: Monthly number of successful Aadhaar e-KYC verifications as per NPCI, Apr 2016 – Mar 2017
Aadhaar also powers microATMs, portable point-of-sale devices that can be carried by business correspondents and used to provide banking services at or near one’s home, potentially diminishing geographic barriers to financial services for the rural poor. The value of transactions conducted through microATMs, using Aadhaar authentication, grew by 26 times in the past year, from ₹86 crore ($12.8 million) in FY 2015-16 to ₹2,282 crore ($341 million) in FY 2016-17.

Using the foundation of unique identification provided by Aadhaar, payment systems have emerged that attempt to solve different market frictions. The Aadhaar Payment Bridge System (APBS) is used for Direct Benefit Transfers (DBT) from the government to individuals. In FY 2016-17, ₹22,006 crore ($3.3 billion) was transferred using APBS, which was 33 percent of the total DBT value in that year.

The Aadhaar Enabled Payment System (AEPS) allows those who live or work far from a bank branch to carry out banking transactions through trusted intermediaries (using microATMs).

Another payment system, Unified Payments Interface (UPI) is a platform that facilitates banking transactions through applications developed for both smart phones and feature phones. About 6.4 million transactions were conducted using UPI, totaling ₹2,425 crore ($362 million), in March 2017.

While growing fast, payments routed using Aadhaar-enabled systems formed only 6.67 percent and 0.06 percent of the total volume and value, respectively, of digital financial transactions in March 2017.

In addition, there are important gaps in our understanding of how Aadhaar is impacting financial inclusion in India. Two themes for research that can aid practitioners today are: a) how best to implement Aadhaar use-cases for financial inclusion, with a particular focus on take-up, efficiency, and infrastructure, and b) the impact of Aadhaar-enabled tools on access and usage of financial services, and consumer welfare.

Social protection

We estimate that the Government of India spends more than ₹3 lakh crore ($47 billion) annually on social protection—more than one-sixth of its total budget. It aims to provide robust safety nets to India’s poor, including food subsidies, employment guarantees, and direct cash transfers. However, the efficacy of these social protection programmes has been constrained by financial leakages and service delivery inefficiencies.
A majority of the central government’s social protection expenditure—more than ₹2.4 lakh crore ($36 billion)—uses Aadhaar in one or more ways. According to UIDAI reports, Aadhaar has the potential to enhance the effectiveness of India’s social protection programmes in three ways.

First, fake beneficiaries and duplicates can be removed by linking a person’s (unique) Aadhaar number to her or his identity record in each programme’s database. About three quarters of the beneficiary names across four major social protection programmes have now been linked to their Aadhaar numbers. See Figure ES.4 for a programme-wise breakdown of Aadhaar seeding. According to the DBT portal, ₹14,000 crore ($2.1 billion) in food subsidies and ₹26,000 crore ($3.9 billion) in cooking gas subsidies were saved, by removing 23 million and 35 million duplicates, respectively. However, the role of Aadhaar in these savings needs to be studied further.

Second, Aadhaar-enabled electronic transactions can authenticate each beneficiary using her or his biometrics, thus reducing the potential for fraudulent transactions. For example, the Government’s largest subsidy programme, the Public Distribution System (PDS), has equipped 186,726 (35 percent) of its shops with electronic point-of-sale (ePoS) machines that are used to authenticate each transaction. Despite this potential, authentication failure rates reported by Andhra Pradesh and Telangana highlight the need for more research to understand and ensure adequate coverage. From April 2015 to March 2017, the pension programme in Andhra Pradesh reported fingerprint authentication failure for 17.4 percent individuals, despite three attempts. Similarly, the failure rate averaged 7.8 percent for the Mahatma Gandhi National Rural Employment Guarantee Scheme in Telangana. We illustrate the failure rate over time in Figure ES.5.
This “failure rate” may include those who were trying to fraudulently access benefits (which is the purpose of authentication). These numbers do not necessarily indicate exclusion as shop owners can use an override facility over Aadhaar’s authentication results. However, investigating the true rates of exclusion with and without Aadhaar, and contributing factors, are an important area of future research.

Third, Aadhaar enables Direct Benefit Transfers (DBTs) to beneficiary bank accounts, which can reduce siphoning by middlemen as well as payment delays. About 33 percent of all DBTs in FY 2016-17 were made using APBS with the rest relying on older systems such as National Electronic Funds Transfer (NEFT). However, rigorous evaluations are needed to determine whether and to what extent Aadhaar-enabled DBT reduces financial leakages and payment delays.

Despite the growing number of applications of Aadhaar for social protection, there remain key gaps in our understanding of whether and under what conditions Aadhaar can best be utilised to improve social protection in India. Three important themes for future research are: a) representative estimates of whether and how genuine beneficiaries are excluded, in order to design strategies that reduce exclusion, b) research to strengthen implementation (for example, technological preparedness, beneficiary time-use and experience, and connectivity infrastructure), and c) evaluations that examine the impact of Aadhaar use-cases on financial leakages and service delivery, in order to inform decisions on which use-cases to expand.

**Emerging uses**

Along with financial inclusion and social protection, newer uses of Aadhaar are emerging in a diverse set of sectors, including health and education. Several Application Programming Interfaces (APIs) have been developed building off the identity verification provided by Aadhaar. These include DigiLocker (“a platform for digital issuance and verification of documents and certificates”) and Electronic Signature (e-Sign). These crosscutting APIs are often referred to as the “India Stack.”

As of April 2017, there are about 5 million users of DigiLocker who have uploaded more than 7 million documents (see Figure ES.6). The Central Board of Secondary Education (CBSE) uses Digi Locker to issue students’ mark sheets, migration certificates, and passing certificates, and has uploaded more than 11 million documents. E-Sign is also used across many sectors. As of April 2017, nearly 400,000 documents on Digi Locker were signed using e-Sign.

Aadhaar’s uses are increasingly being taken up in other sectors as well. In healthcare, Aadhaar is being linked to a Unique Health Identity (UHID), a digital identity issued by healthcare providers to track patients and help secure relevant health documents. The government is trying to improve governance through initiatives like monitoring staff attendance using Aadhaar authentication. In the telecommunications sector, Aadhaar-based e-KYC is being used for real-time and digital verification of subscribers. Private sector start-ups are also beginning to use India Stack elements for uses such as background verification of prospective employees. A more complete list of applications in various sectors is provided in Chapter 6 of the main report.

As these new use-cases proliferate, two important themes for future research arise: a) research on the implementation quality of use-cases, especially take-up, efficiency, and infrastructure, and b) evaluations on the impact of Aadhaar-linked uses compared to the counterfactual of non-Aadhaar alternatives.
Looking ahead

Aadhaar enrolment has reached near-universal coverage in most parts of the country, and use-cases continue to evolve and mature. Rigorous empirical evidence is required to develop a more nuanced understanding of Aadhaar’s uses and impacts and to provide policy inputs. We hope that the government will proactively share more information, and researchers will work in active collaboration with practitioners. Such a collaborative effort on policy-relevant research can facilitate a clearer understanding of what is working well and what needs to be improved in the Aadhaar space. We hope that such efforts will enable Aadhaar to achieve its stated objective of empowering India’s residents.
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